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fix. Of this we find in this list three instances. These are *nu—ua*, *nik—ika* and *nifi—afi*. The second of these is paralleled in Indonesia by *nyan* of Tidore. The examination of the particular languages of Indonesia which are more nearly in resemblance with the Yap forms of these critical words serves to indicate the source whence the material derives. In general they are found in parts of the Malay Archipelago within the range of the northern equatorial counter-current, that is to say in regions from which the Celebes Sea and the Straits of Molucca would serve as the most convenient exit eastward. It may be that the *prahus* were pushed along this fairway by the adventurous spirit of their crews, it may be that their sailors came haggard to this land in the waste of waters. However that may be, it is quite clear from this record that Yap received its Polynesian content only at second hand, that the race which has introduced this slight contamination is the Malayan and that its epoch was subsequent to the expulsion of the Polynesians from Indonesia. Reduced to our chronologic scale, this must have been later than the beginning of the Christian era.

Dr. Furness has put it within our power to dissect out a few facts about the peopling of Yap. The relationships of the principal mass of the population after this Malayan admixture has been factored out remain for closer study of the people of Yap and for a richer supply of Micronesian data upon which comparisons may be based.

GEOGRAPHICAL RECORD

THE SOCIETY'S EDUCATIONAL EXHIBITION

The collection of European maps, atlases and text-books made by the American Geographical Society late in 1908, was exhibited at the State Normal School, Worcester, Mass., from May 11th to May 30th last. This account of the exhibition has been sent to the *Bulletin*:

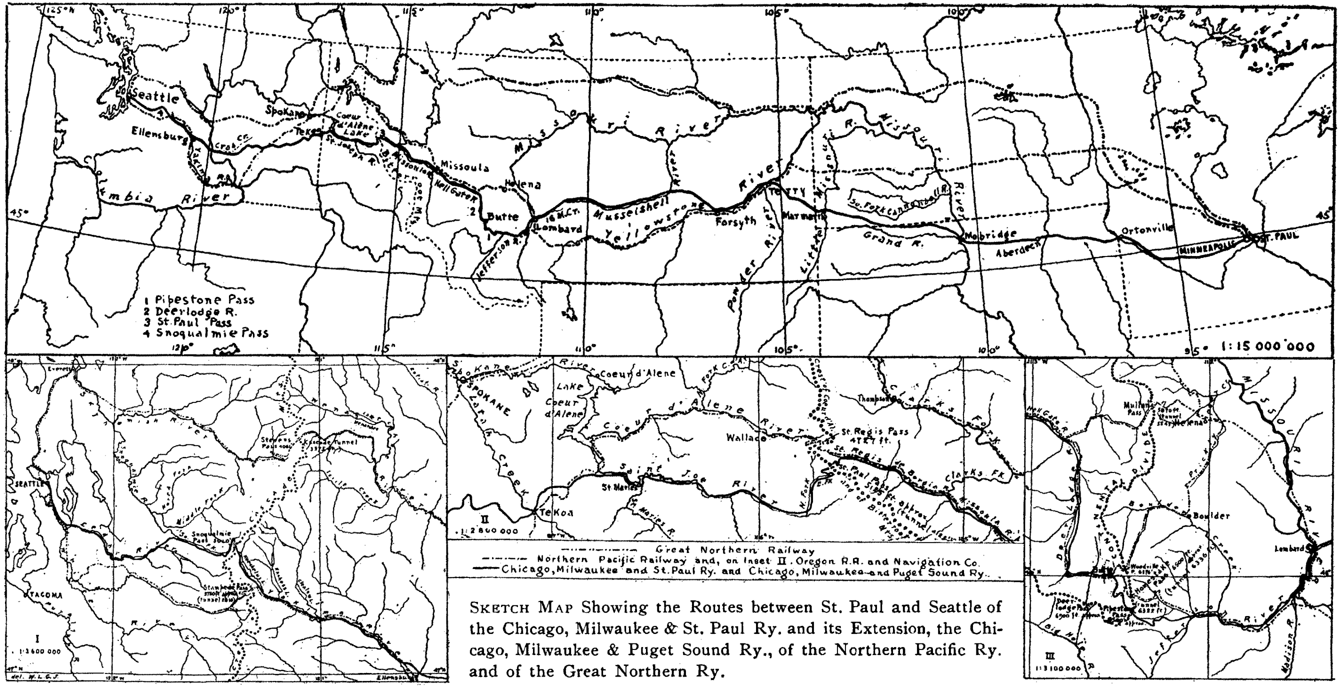
"Notice was sent to all schools in neighboring towns, and teachers from many places in Worcester County visited the exhibition. A number of classes in charge of teachers from the city schools also improved the opportunity. The text-books and atlases were displayed in one room and carefully arranged so that the visitor might see their value and be attracted to examine them. Special explanations of the best features of these books were given to groups of visitors. The atlases especially attracted attention for their fine workmanship. The maps were displayed by countries: those of Austria in one room, of England in another, of Belgium in another, and the German maps in the long corridor of the school. Most of these were hung level with the eye, so that they might be closely inspected. A typewritten description was attached to each map, and as far as possible the exhibition was made self-explanatory. The special points of value of each map were noted.

"In class-room work a discussion of what a school-room wall map ought to represent was undertaken, and this was followed by an inspection of the maps, to note which exhibit most nearly met the ideal. The exhibition was successful in its educational influence, which will tend to promote improvement in geography work in this neighborhood. The Worcester State Normal School congratulates the American Geographical Society upon what it is doing in the interest of geography instruction."

NORTH AMERICA

New Transcontinental Railroad. (See map p. 520.) On May 28th through passenger service began on the Chicago, Milwaukee and St. Paul Railway between Chicago and Seattle. This marks the opening to through traffic of a new transcontinental road.

From Chicago to the Missouri River the line follows the route of the Chicago, Milwaukee and St. Paul Railway, previously in existence, via Milwaukee and St. Paul, thence due W. via Ortonville, Minn., and Aberdeen, S. D., to Mobridge on the Missouri R., at the mouth of the Grand R. From here to Seattle the route is over the new Chicago, Milwaukee and Puget Sound Railway. After crossing the Missouri R. at Mobridge, the line continues to the W. N. W., between the Grand R. and the South Fork of the Cannon Ball R., crosses the Little Missouri R. at Marmarth and reaches the Yellowstone near Terry, Mont., near the mouth of the Powder R. The Yellowstone valley is then ascended to Forsyth (106⅔° W.), the line paralleling the Northern Pacific Railway for this distance. From here the line crosses over to the Musselshell R. at its bend from an easterly to a northerly course, ascends to its head, crosses over to the valley of Sixteen Mile Creek and descends it to the Missouri R., which it reaches at Lombard. From here to the head of the St. Regis de Borgia R., for practically the whole of this distance of about 300 miles, the C., M. and P. S. Ry. in its course up the lower Jefferson R., through Butte and down the Deer Lodge, Hell Gate and Missoula Rivers, parallels the main line of the Northern Pacific Ry. or one of its branches, usually following the opposite bank of the watercourses used by its rival. The only deviation from the Northern Pacific's line is at the Continental Divide, which the C., M. and P. S. Ry. crosses by means of two tunnels under Pipestone Pass at an elevation of 6,322 feet, only five miles south of Homestake Pass, followed by the Butte Branch of the Northern Pacific. (See Inset Map III.) Ascending the St. Regis de Borgia R. to near its head, the new line deviates to the left from the Cœur d'Alène Branch of the Northern Pacific and crosses the crest of the Bitterroot Mts. by a pass which has been termed "St. Paul Pass" (elevation of tunnel, 4,125 feet, about 1,000 feet below summit of pass), leading to the East Fork of the St. Joseph R., which it descends through an unfrequented region to the main river, past the southern end of Cœur d'Alène Lake to Tekoa, Wash. (See Inset Map II.) Here the line enters upon the Columbia Lava Plain, which it crosses in a W. S. W. direction, reaching the Columbia R. at the mouth of Crab Creek. Crossing the Columbia it continues to Ellensburg, where it again meets the Northern Pacific line and parallels it in its ascent of the Yakima R., again deviating from it, however, in crossing the summit of the Cascades by Snoqualmie Pass (3,010 feet), 11 miles N. of Stampede



SKETCH MAP Showing the Routes between St. Paul and Seattle of the Chicago, Milwaukee & St. Paul Ry. and its Extension, the Chicago, Milwaukee & Puget Sound Ry., of the Northern Pacific Ry. and of the Great Northern Ry.

Inset I shows the railroad routes across the Cascade Mts. between 48° and 47° N.; Inset II those across the Cœur d'Alène–Bitterroot Divide between 47°45′ and 47°10′ N., and Inset III those across the Continental Divide between 46°50′ and 45°35′ N.

Railroad routes are compiled from the Post Route Maps of the Post Office Department. Situation is based on the state maps of the General Land Office and the topographic sheets of the Geological Survey.

Pass, used by the Northern Pacific. (See Inset Map I.) Seattle is reached by way of the upper Snoqualmie R. and the Cedar R.

The new line was built in remarkably short time. The 1,400 miles of the C., M. and P. S. Ry. between Mobridge and Seattle were completed in less than three years, between April, 1906, and March, 1909. Freight service was instituted in July of the latter year and continuous local passenger service has already been in effect for some time.

The distance between St. Paul and Seattle by the new line is 1,770 miles, as against 1,828 by the Great Northern Ry. and 1,911 by the Northern Pacific Ry. As its gradients are very favorable, the Chicago, Milwaukee and Puget Sound Railway will be seen to have every opportunity for competing with its rivals for the ever-increasing trade with the Orient. W. L. G. J.

GEOLOGICAL SURVEY OF ALABAMA. The Alabama Legislature at its last session voted to expend $10,000 annually for topographic mapping in coöperation with the U. S. Geological Survey, as has been done in several other States.

Mr. M. J. Munn of the U. S. Geological Survey has recently completed for the Geological Survey of Alabama a report on the natural gas field of Fayette County, which was discovered early last year. A *Bulletin* on good roads by Dr. W. F. Prouty, is nearly completed.

GEOLOGICAL AND NATURAL HISTORY SURVEY OF CONNECTICUT. Prof. William North Rice of Wesleyan University, Superintendent of this Survey, informs the *Bulletin* that "the Survey is planning for the next two years to devote most of its appropriation to an investigation of the water resources of the State, both above and below the surface of the ground, in coöperation with the U. S. Geological Survey. The field work is to be done mainly by Mr. A. J. Ellis, under the direction of Prof. H. E. Gregory of Yale University. During the ensuing biennial term a small area in the vicinity of Hartford will be thoroughly studied. In subsequent years it is intended to extend the survey of the water resources over the entire State; and it is hoped that the great importance of the work will appeal so strongly to the public that a more liberal appropriation can be obtained from the Legislature two years hence. The fact that so many of our large towns have been, in recent years, threatened with water famine shows the timeliness of the proposed investigation.

"A number of Bulletins already contracted for are finished or nearly so, and it is hoped they may be published during the next two years."

STATE SURVEY COMMISSION OF MAINE. At the last session of the State Legislature the State Survey Commission and the State Water Storage Commission were consolidated. The work will hereafter be carried on under the direction of the latter commission.

THE OKLAHOMA GEOLOGICAL SURVEY. The Survey has four parties in the field this summer. Prof. D. W. Ohern, head of the Department of Geology at the State University, is doing areal mapping in the Vinita quadrangle (N. E. Oklahoma). The Pawhuska and Nowata quadrangles have been surveyed and the Claremore and Vinita quadrangles are being worked up this year. The area embraced includes the northern part of the Oklahoma oil fields.

Prof. C. H. Taylor of the University has a party in the Wichita Mountains (S. W. Oklahoma), investigating the granites there. He will prepare a *Bulletin* to be published by the U. S. Geological Survey on Oklahoma granites. The

Ohern and Taylor parties are coöperative, the expenses being shared by the Federal and Oklahoma Surveys.

Dr. J. W. Beede of Indiana University, the eminent authority on Permian, who has spent some years in Kansas, Texas and New Mexico studying this problem, is in central Oklahoma endeavoring to trace out the Pennsylvanian-Permian contact across the eastern part of the Oklahoma Redbeds. His party outfitted near the Kansas line and will work as far south as possible this summer.

Dr. C. A. Reeds of Bryn Mawr College, who has already spent five years studying the Hunton and Viola limestones in the Arbuckle Mountains, has a party in the same region this year. He has already published with the Oklahoma Survey and will shortly publish with the Federal Survey.

THE WIRE-GRASS COUNTRY OF SOUTH GEORGIA. Mr. Roland M. Harper has a paper in the Savannah *Morning News* (April 16, 1911) on the remarkable development in the wire-grass regions once supposed to be almost worthless. All these lands have sandy soil and open forests of long-leaf pine, carpeted with wire-grass, but they differ in topography and drainage. The region extends from near the Savannah River to the southwestern corner of the State, then through West Florida, southwestern Alabama and Mississippi into Louisiana. It is quite sharply distinguished from the lime-sink region bordering it on the inland side, but on the southeast it passes very gradually into the flat pine woods. It embraces about 1,100 square miles in Georgia, or nearly one-fifth of the State. Fifty years ago it was considered almost hopelessly sterile, and in 1860 the density of population was only about four to the square mile. When the richer limestone and red clay lands became settled attention was given to the once despised sandy lands simply because larger areas for cultivation were needed. The farmers learned to treat this land so as to get satisfactory results from it. It was more easily tilled than clay land, it did not wear out and wash away so rapidly, and commercial fertilizers have done much to make it very valuable. About 100,000 new settlers came in between 1890 and 1900, making the increase of population about sixty-two per cent. A few years ago several new counties were created in this area, and twenty-two new railroads now cross it in Georgia. The density of population of the rolling wire-grass country is now about thirty-one to the square mile, and the wire-grass farmers are boasting of the fertility of the soil which their grandfathers regarded as worthless.

ALTITUDES IN THE STATE OF WASHINGTON. The U. S. Geological Survey has just published *Bull.* 457, giving the results of spirit levelling in the State of Washington, 1896 to 1910, inclusive, compiled under the direction of R. B. Marshall, Chief Geographer, in coöperation with the State. The report gives the exact elevations above mean sea-level of about 1,700 points in different parts of Washington. This is one of a series of similar reports which will cover the results of spirit levelling by the Geological Survey in all parts of the country.

INCREASED METAL PRODUCTION IN THE UNITED STATES IN 1909. An advance chapter from "Mineral Resources in the United States, 1909" on "The Production of Metals and Metallic Ores in 1908 and 1909," by Waldemar Lindgren, shows that in 1909 the total production had a value of $870,445,230; that for 1908 was valued at $649,779,613. Pig iron led in 1909 both in quantity and value, the output being 28,638,883 short tons, valued at $411,544,773, of which 27,689,883 tons valued at $397,907,510 were derived from domestic ores. Refined copper, gold, silver and lead in value of production followed in the order named.

The following are statistics of ore production in our country (short tons) in 1909 as compared with 1908:

	1909	*1908*
Iron Ore	57,449,584	40,301,336
Copper Ore	28,025,092	22,358,857
Zinc and Zinc Lead Ores	10,679,608	8,157,963
Gold Ores	9,241,827	8,991,751
Lead Ores	5,811,687	5,082,853

FROST DATA OF THE UNITED STATES. Frost data are universally recognized as among the most important meteorological records, for upon the occurrence of first and last frost, and upon the length of the crop-growing season, depend the success or failure of many crops throughout the extra-tropical latitudes of the world. In the latest *Bulletin* (V) of the Weather Bureau, Mr. P. C. Day, Chief of the Climatological Division, has brought together and charted the "Frost Data of the United States" (Washington, D. C., 1911), and has also ascertained the length of the crop-growing season as determined from the average of the latest and earliest dates of killing frost. This study is a distinct step in advance, for hitherto the frost charts published by the Weather Bureau (as in *Bulletin* Q) were based in the main on data collected at the regular stations of the Bureau, about 150 in number, located primarily in the larger cities and towns. Obviously, such data are of far less value than those which can be obtained in the country, and in the new charts the observations made at about 1,000 coöperative stations scattered over the farming districts were summarized, the period covered by these records embracing usually 10-30 years. Thus the conditions resulting from the local topography have been brought out, and the actual facts of frost occurrence are far more accurately presented than heretofore.

The new *Bulletin* contains five charts, viz., average date of last killing frost in spring; average date of first killing frost in autumn; latest date at which a killing frost has occurred in spring; earliest date at which a killing frost has occurred in autumn, and the average length of the crop-growing season. These charts will prove more useful to agriculturists, and to the public generally, than the earlier ones. We now have actual conditions of frost occurrence, and can study, in a large way, the effects of topography, land and water, and of other controls. A brief discussion accompanies the charts. R. DEC. WARD.

RAINFALL, EVAPORATION, DRY FARMING. "The guidance of prospective settlers in regions of limited rainfall" was the object in the preparation of a recent *Bulletin* (No. 188) of the Bureau of Plant Industry, entitled "Dry Farming in Relation to Rainfall and Evaporation," by Lyman J. Briggs and J. O. Belz. The whole subject is of vital importance to thousands who are already living in the region west of the 100th meridian. The writers have shown their appreciation of the conditions in their recognition of the importance of the seasonal distribution of rainfall, the rate at which the rain falls, the amount of the run-off, and the amount of evaporation. Usually, the mean annual rainfall is the only feature of the precipitation which receives attention. A discussion of the annual rainfall in the dry farming regions of the United States is followed by a comparison of the monthly distribution of rainfall on the Great Plains, in the Intermountain and on the Pacific Coast regions. The relation of monthly distribution of rainfall to farm practice; of the character of rainfall to its usefulness; the run-off during torrential rains; hail; evaporation in dry farming sections; evaporation as influencing agriculture in the Great Plains, and the relation of yield to rainfall—all subjects which have needed just such study—are clearly and briefly discussed. A series of small rainfall maps, by States, showing the mean annual rainfall by 5 inch isohyets, and also in figures, will prove extremely useful to farmers over the region here considered. These maps have the great merit of not being overloaded with details. Tabulated precipitation data for a large number of stations are also included. The *Bulletin* may be highly recommended for its brevity, clearness and compactness.

R. DeC. Ward.

Climate of Porto Rico. The acquirement, by the United States, of the island of Porto Rico is bearing fruit in the excellent climatological studies which are being made there by Dr. Oliver L. Fassig, Section Director of the Weather Bureau at San Juan. There has recently been published by the Weather Bureau a twelve-page report (quarto) on "The Climate of Porto Rico," with three charts of temperature, winds and rainfall (mean annual temperature and prevailing winds; average annual extremes of temperature; average annual rainfall, 1900-1909), and one page of diagrams showing the monthly distribution of rainfall at twenty stations on the island. The same article has also appeared in "The Register of Porto Rico for 1910" (8vo, pp. 20), including a map of the island. Further, in the *Monthly Weather Review* for February, 1911, Dr. Fassig has a discussion of "The Normal Temperature of Porto Rico, West Indies," with charts of mean annual, January and July temperatures, and mean daily maximum and minimum temperatures. R. DeC. Ward.

Prof. Pittier's Investigations in Panama. Prof. H. F. Pittier, of the Bureau of Plant Industry, Dept. of Agriculture, who is engaged in a botanical survey of the Canal Zone under the auspices of the Smithsonian Institution, was, on his arrival, engaged by the Government of Panama to extend his investigations to the territory of that republic. In this connection he devoted his attention mainly to the province of Chiriqui, which he considers economically to be the salvation of the country, as the other provinces of the Republic are totally unsuited to agriculture. Chiriqui Volcano was ascended and its height tentatively determined as 3,374 meters (11,070 feet). Its character is totally different from that of its neighbor, the Irazú of Costa Rica, as it lies almost wholly in the subtropical zone of the Pacific Slope. The savannas sloping from its foot to the coast of the Pacific afford good illustrations of the desiccating influence of wind. During the dry season the soil becomes hard and bears only scant vegetation, while the isolated trees which occur are bent to leeward. The streams issuing from the volcano flow in deep ravines amid a rank vegetation. The calmness of the air, the luxuriance of the flora in these deep protected gullies present a striking contrast to the wind-swept barren plain above. (*Pet. Mitt.*, May, 1911.)

SOUTH AMERICA

Professor Kühn in the Andes. Prof. Franz Kühn of Buenos Aires, in February and March explored the section of the Andes lying N. of Mt. Aconcagua between 31°30′ and 32°50′ S. under the auspices of the Argentine Department of Agriculture. The route lay west from San Juan to Calingasta at the foot of the main eastern range, and thence mainly over transverse passes, two of which were hitherto unknown, to the line of the Trans-Andine Railroad. The detailed results will be published later. (*Pet. Mitt.*, May, 1911.)

WORK IN DUTCH GUIANA. The exploration of Southern Dutch Guiana, to promote which the Geographical Society of Amsterdam, together with the Surinam Committee, aided by the government of the Netherlands, fitted out seven expeditions during the last fifteen years, has just successfully been brought to a close, thereby eliminating the last unknown area from the map of this colony. [A brief notice of the termination of the work of Lieut. Eilerts de Haan appeared in the *Bulletin,* March, 1911, p. 136.]

One of the main results of the last expedition is the determination, by Lieut. Kayser and Dr. Hulk of the lower course of the Lucie River, discovered by Lieut. Eilerts de Haan in 1909, who had unfortunately succumbed to an attack of malaria incurred on this expedition. The Lucie River empties, as foreseen, into the Corentyne River, which forms the boundary between British and Dutch Guiana, but far more to the north than supposed, so that in its upper parts it must turn from its westerly to a northerly course, and either traverse or circumvent to the west the Wilhelmina Range. (*Pet. Mitt.,* April, 1911.)

DR. KOCH-GRÜNBERG RETURNS TO THE AMAZON BASIN. Dr. Koch-Grünberg, the ethnologist, started upon a new expedition into the upper Amazon Basin in April under the auspices of the Berlin Museum of Ethnology. He intends to penetrate to the headwaters of the Yapurá River, traversing to the upper part of the Guaviare River and, in descending, to explore the region on the divide between the Orinoco and Amazon systems and their affluents, in particular the Inirida of the former and the Guainia and Uaupés of the latter system. (*Pet. Mitt.*, April, 1911.)

EXPLORATIONS IN BOLIVIA. Dr. T. Herzog, the German botanist, who undertook an exploring expedition in Bolivia in 1907, has resumed his investigations. Although botany is his prime interest, he is also devoting attention to the topography and the aborigines of the country. In the autumn of 1910 he started from the northernmost point in Argentina to be reached by railroad, near Oran, Salta Province (23° S.), and followed the eastern rim of the Cordillera for a distance of over 350 miles to Santa Cruz de la Sierra (17¾° S.), which he reached Feb. 26th of the present year. The record he has kept of his route, supported by various determinations of latitude and mountain ascents allowing of sketching the surrounding country, will enable him to represent the position of the eastern rim of the Cordillera more accurately than has been done heretofore. Resuming his journey he intends to travel to the W. N. W. via Cochabamba to La Paz, and will endeavor to locate the divide of the Sierra de Cochabamba. (*Pet. Mitt.*, May, 1911.)

RELIEF MODEL SHOWING THE EFFECTS OF THE VALPARAISO EARTHQUAKE. Mr. G. C. Curtis of Boston, Mass., whose paper on "Land Reliefs that are True to Nature" was published in our June number, has just completed and installed in the Harvard Geological Museum a relief showing the effects of the earthquake at Valparaiso. It was made under the supervision of Professor J. B. Woodworth, and is a geographical "bas relief," to use the terms of figure sculpture. The relief shows the broken buildings in the foreground, the city in the middle distance, with roadstead and shipping backed by the sea horizon in the distance.

AFRICA

MAJOR GORDON LAING'S GRAVE DISCOVERED. *La Géographie* (No. 3, 1911) reports that M. Bonnel de Mézières was recently charged by Governor Clozel of Haut-Sénégal-Niger with the work of making a study of the salt mines of Taudeni and was further instructed to make special inquiries concerning the death of Major Alexander Gordon Laing, who, it will be recalled, was murdered in 1826, on the third day after he had left Timbuktu to return to Tripoli, whence he had started southward across the Sahara in the previous year. This fact was known from native reports, but nothing further had been learned of his fate.

On his way north to Taudeni, M. Bonnel de Mézières examined certain records at Arauan, from which he read that Laing had been assassinated and buried at a place called Saeb, about 30 miles north of Timbuktu. This information was confirmed by natives whom he met, and he was able to discover the scene of the assassination and the place where the body had been buried. The remains of Laing were found about 3 feet beneath the surface.

Laing was born at Edinburgh on Dec. 27th, 1794. He was sent as a Lieutenant of Infantry to Sierra Leone, where Sir Charles MacCarthy, Governor General of the British possessions in West Africa, sent him on a mission to study the sources of the Niger (1821-1822). He wrote a very interesting account of these travels entitled "Travels Through Timannee, Kooranko and Soolima countries in Western Africa" (London, 1825). In 1823 he took part in the war against the Ashantis, and the British Government sent him in 1824 to cross the Sahara from Tripoli to Timbuktu. He reached that town on the southern edge of the Sahara on August 18, 1826. On Sept. 24th he was assassinated in the desert. When Dr. Oscar Lenz crossed the Sahara to Timbuktu in 1880-1881, he sought in vain for traces of Laing.

PROF. HANS MEYER RETURNS TO AFRICA. This well-known geographer, who made the first ascent of Kilimanjaro, the highest mountain in Africa, started in May on his fourth journey in East Africa. After reaching Bukoba on the west shore of Victoria Nyanza he proposes to travel to Lake Kivu and the Kirunga group of volcanoes in order to study the relations of the volcanic phenomena to the tectonic structure of the western rift system at this point. From Lake Kivu his expedition will go to Lake Tanganyika, and if possible also to Lake Nyasa. Besides geological investigations, the botany, zoology and ethnology of the regions traversed will also receive attention.

THE FRENCH SAHARA. M. N. Villate gives an account of his recent journeys from Tidikelt to the Niger by the Ahaggar, and adds to our accurate knowledge of the French Sahara. His object was to extend the network of astronomically determined positions, and he succeeded in obtaining the latitude and longitude of forty-nine points. Equal altitudes of stars were observed for latitude and chronometer correction; longitudes were obtained when practicable by occultation of stars, and chronometer watches furnished a means of determining the difference of longitude between neighboring points on the route. Observations were also made of the magnetic declination, inclination, and horizontal force at some thirty-five to forty points from Biskra in the north, to Gao on the Niger in the south. In consequence of changes which were found to have taken place in the magnetic moment of the magnets during the journey, values of the horizontal force can only be given to three places of decimals of C. G. S. units. (*La Géographie*, No. 3, 1911.)

EXPLORATIONS IN THE LAKE CHAD REGION. Miss Olive MacLeod, who, with Mr. and Mrs. P. A. Talbot, has been exploring the country round Lake Chad for several months, returned to England on Tuesday. The expedition passed up the Niger and Benue Rivers by steamer and canoes, through Southern and Northern Nigeria, and then traversed the North Kamerun. French Ubangi was reached in October last. A splendid reception was accorded to the party by the Lamido at Lere. The mysterious falls on the Mao Kebi were located, and have been named Les Chutes MacLeod. After mapping this part of the river, the party went through the Tuburi Lakes and down the Logone to Fort Lamy. The expedition then proceeded down the Shari to Lake Chad, which was crossed, in Kotoko canoes, from the Shari to Saiyorum. Close studies were made of the various peoples visited, especially of the little-known tribes of French Central Africa and the Baduma of Lake Chad. A large collection of objects of ethnological interest was made, especially of musical instruments, while typical examples of music were taken down. A botanical collection of several thousand specimens has been sent to the British Museum, as also a number of birds, beasts and reptiles. A route-sketch was made across Lake Chad, and a survey by plane table and theodolite from Maifoni to Kano. (*Nature,* May 11, 1911.)

ASIA

PETROLEUM NEAR THE GULF OF SUEZ. Petroleum deposits have long been known to exist on the west coast of the Gulf of Suez, but it has not been believed till recently that they were important. Within the last two years, however, fresh borings have been made in Gemsah Peninsula, about 165 miles from Suez, and at a depth of 1,265 feet a fountain was struck which threw up a column of oil 100 feet high. This oil contains a large proportion of benzine and is free from water. Another well at Gemsah is yielding about 600 tons per day. These wells are near the coast, and the intention is to work them next year. Reservoirs and refining works are being erected at Port Tewfik, near Suez. Experimental borings are now being made at Jebel Zeit on Gaysum and Taouila Islands and at Abou Zenima, 60 nautical miles from the coast. (*Les Matières Grasses,* Vol. IV, p. 2129.)

GROWTH OF THE MANILA HEMP INDUSTRY. Mr. Wileman, British Consul at Manila, reports that during the past few years the production of hemp in the Philippines has been steadily increasing. The production in 1909 was 1,280,000 bales; in 1910, 1,340,000 bales, and it is expected this year to reach over 1,400,000 bales. The weather of the past few years has been especially suitable for Manila hemp growing, and though the price of the commodity has fallen considerably, the tendency to increased production is not checked.

AUSTRALASIA AND OCEANIA

RAINFALL OF NEW SOUTH WALES. The rainfall of New South Wales has been carefully studied and discussed, in tabular and cartographic form, in a recent publication of the Commonwealth Bureau of Meteorology of Australia, by Henry A. Hunt, Commonwealth Meteorologist (*Results of Rain and River Observations made in New South Wales during 1903-1908,* 4to, 1910). The volume contains all available rainfall totals up to the end of the year 1908, from 2,298 stations. Annual and monthly summaries and maps are given for each of the years 1903-1908. On the annual maps there is an innovation which adds much to their value, the regions which had an excess of rainfall above the mean annual amount being colored pink. The chart which will be most generally useful is a large one showing the average annual rainfall (in figures and by means of isohyets) for New South Wales up to the end of 1908. The number of stations whose records were used is 1,078. The principal object in compiling these maps was an economic one. If the 15-inch mean annual rainfall line be taken as the limit of successful wheat-growing (an assumption which is, of course, reasonable only with many qualifications), there exist to the westward of this line, in New South Wales, some 50,000 square miles of country "open for wheat prospecting, with probabilities of satisfactory results." In addition, the volume contains curves showing the height of many of the rivers for each year of the period 1903-1908. R. DEC. WARD.

EUROPE

THE NEW TUNNEL IN THE ALPS. On March 31 last, the workingmen who have been excavating the tunnel of Loetschberg, met under the Bernese Oberland, having finally pierced the tunnel which is to form part of another connection between Italy and Northwest Europe. The work of excavation, begun on Nov. 1, 1906, has had only one serious interruption, and that was when the breaking down of a part of the tunnel in July, 1908, admitted the waters of the Kander River and made it necessary to deviate to some extent from the line of construction as originally planned. The tunnel will not be ready for railroad service till 1913. Its length is 14½ kilometers, or about 9 miles. Sections of railroad are now building to connect the tunnel with Brigue on the south and with Frutigen on the north, and when the whole enterprise is ready for operation in 1913 trains will pass through the Simplon and Loetschberg tunnels, and Italy will have a new outlet to the north by way of Brigue, Bern and the Rhone Valley saving several hours time between Milan and Paris. The enterprise has been largely promoted by the business interests of Bern, which will thus be placed in direct relations with Northern Italy.

POLAR

THE FRAM RETURNS TO BUENOS AIRES. A Reuter message reports the arrival of the *Fram* in Buenos Aires about the middle of April, after leaving the Amundsen expedition at King Edward VII Land. The vessel intended soon to leave Buenos Aires for scientific work in the Atlantic between Africa and South America. Her commander, Capt. Nilsen, expects to return to the Argentine capital and will start south from there about Oct. 1, to bring Capt. Amundsen and his party back north. It is expected that he will go through the Pacific on his way to the Arctic Ocean through Bering Strait stopping at San Francisco to take on supplies.

PEARY THANKED AND HONORED BY CONGRESS. Before Congress adjourned in March, it passed a bill to retire Commander R. E. Peary with the rank and pay of a Rear Admiral and to extend to him the thanks of Congress.

MR. LEFFINGWELL ON THE ARCTIC COAST. Dr. C. W. Leffingwell sends to the *Bulletin* a letter from his son, Ernest DeK. Leffingwell, written at his camp on Flaxman Island, north coast of Alaska, on Oct. 20th, 1910, containing some information supplementing our previous report (*Bulletin*, March, 1911, pp. 199-200). After returning to Flaxman Island from his survey trip to the west he built at Flaxman a storehouse, added a second floor to his cabin, and put everything in good condition for the winter in camp. His food stores for the winter consisted of flour, with a fair amount of caribou, duck and fish, and seals for dog feed. He expected to spend most of last winter in astronomical work and the mapping of his surveys.

RETURN OF THE JAPANESE EXPEDITION. According to a Reuter despatch, the Japanese Antarctic Expedition abandoned the idea of attempting to reach the South Pole and arrived at Sydney on their return on April 30th. Their schooner, the *Kainan Maru,* which started South from New Zealand in February, was obliged to turn back on account of ice packs and icebergs. The decision to return was also influenced by the fact that ten of the twelve dogs which they had taken along as a sledge team succumbed to the cold. The *Kainan Maru* cruised for four days in the vicinity of Coulman Island, South Victoria Land, and then started for Sydney.

OBITUARY

WILLIAM GÖTZ. Professor Wilhelm Götz died in Munich on March 25. Since 1900 he had filled the chair of geography in the Polytechnic Institute of that city, after ten years in the same position in the Royal Bavarian Military Academy. Professor Götz's investigations were mainly devoted to economic and historical and to local regional geography. His most important contributions to science are his Manual of Economic Geography, his treatise on the routes of world commerce ("Verkehrswege im Dienste des Welthandels," 1888), his Historical Geography (1904), his Geographico-Historical Manual of Bavaria (2 vols, 1895 and 1898) and his Regional Geography of Bavaria (1904). (*Pet. Mitt.,* April, 1911.)

PERSONAL

Prof. C. H. Hitchcock, Emeritus Professor of Geology at Dartmouth College, has come East from Hawaii to complete his field work for the Geological Survey of Vermont. His address for the summer will be at Hanover, N. H.

Sir John Murray has presented a fund of $6,000 to the National Academy of Sciences for the purpose of founding an Alexander Agassiz gold medal to be awarded to scientific men in any part of the world for original contributions to the science of oceanography.

Dr. Walter S. Tower, Assistant Professor of Geography in the University of Pennsylvania, whose paper on "Scientific Geography" was published in the *Bulletin* last year (p. 801), has been called to the University of Chicago.

Mr. F. E. Matthes of the U. S. Geological Survey has delivered a course of twelve illustrated lectures, with laboratory work, before the students of the University of Michigan on "Topographic Mapping."

Dr. John M. Clarke, State Geologist of New York, gave an illustrated lecture before the Departments of Geology and Biology of Colgate University on May 3d. His subject was "The Magdalen Islands and the Bird Rocks."

Dr. Otto Quelle, whom many American geographers met at the Eighth International Geographical Congress (1904) in this country, has been appointed assistant at the Geographical Institute of the University of Bonn, retiring from the editorial staff of *Petermann's Mitteilungen.*

Lord Curzon of Kedleston has been elected President of the Royal Geographical Society in succession to Major Leonard Darwin.

GENERAL

ATLAS OF PORTOLAN CHARTS. The Hispanic Society of America has just produced, under the editorship of Edward Luther Stevenson, Ph.D., a facsimile of one of the most interesting and valuable atlases of these charts, the property of the British Museum and entered as Egerton MS. 2,803. The announcement of the publication says that the atlas, though neither signed nor dated, bears striking resemblance to the work of Vesconte de Maiollo, and appears to have been constructed as early as 1508. "If this date is correct, it is not only the oldest known Portolan Atlas, on whose charts any part of the New World is laid down, but the oldest known atlas in which the coast regions of a very large part of the entire world are represented with a fair approach to accuracy."

Four special charts exhibit parts of the New World coasts, and the Atlantic coast line is sketched on the world chart from Labrador to the La Plata River. The twenty charts also include the Black Sea, the Caspian Sea, the Mediteranean, charts of Spain, the British Islands, the Baltic, the west and the east coasts of Africa, also India and the eastern Asiatic coasts as represented by Cantino and Canerio. The reproduction is an artotype facsimile issued in the size of the original in an edition of 110 copies, with a brief introduction and list of the charts. Portolan charts may rightly be called the first scientific charts or maps of modern times; and it is gratifying that this superior example of the earliest modern atlases is now placed within reach of a limited number of our libraries and collectors.

PROGRESS IN GEODESY. At a meeting of the Research Department of the Royal Georgraphical Society on April 27, Mr. A. R. Hinks discussed recent progress in geodesy. Invar tapes and wires have revolutionized base measurement; gravity surveys have been carried out over large areas, while abnormalities of gravity in more restricted regions have been determined with remarkable accuracy by the torsion balance; arcs of meridian have recently been measured in Spitzbergen, Africa and Peru. In view of so much activity in geodetic work, it is to be regretted that so little has been done of late years in the United Kingdom. The measurement of an arc of meridian and a detailed gravity survey were instanced as pieces of work which should be carried out in the British Isles and discussion on these matters was invited. (*Nature*, May 4, 1911, p. 318.)